CLAIMS

1. An apparatus for applying radiant energy through the skin to an underlying subcutaneous layer or deeper soft tissue layers that includes loculations of fat with fibrous septae made of collagen tissue, to create a desired contour effect without substantially modifying melanocytes in the epidermis, comprising:

a membrane that conforms a contacting exterior surface of the membrane to a skin layer;

one or more thermal electrodes positioned in the membrane;

a focussing element that focuses thermal energy to the underlying collagen tissue, the focusing element and the electrolytic solution creating a reverse thermal gradient from the skin to the collagen tissue; and

a thermal power source coupled to the thermal electrodes.

2. The apparatus of claim 1, wherein the focussing element is positioned in the membrane.

3. The apparatus of claim 1, wherein the focussing element is positioned at an exterior of the membrane between the skin layer and the membrane.

4. The apparatus of claim 3, further comprising:

a coupling device that couples the focussing element to the membrane.

5. The apparatus of claim 3, further comprising:

a bracket positioned around a periphery of the membrane, and supporting the focussing element.

6. The apparatus of claim 1, further comprising:

a fluid passage lumen positioned in the membrane to cool a surface of the skin, the membrane receiving electrolytic solution which transfers thermal energy from the electrodes to the skin and a subcutaneous layer; and

a source of electrolytic solution coupled to the fluid passage lumen.

7. The apparatus of claim 1, wherein radiant energy is applied through a papillary dermis layer.

8. The apparatus of claim 1, wherein radiant energy is applied through a reticular dermis layer.

9. The apparatus of claim 1, wherein radiant energy is applied through a subcutaneous layer and deeper soft tissues.

10. The apparatus of claim 1, wherein the thermal electrodes are RF electrodes, the thermal power source is an RF power source, and the electrolytic solution transfers RF energy from the RF electrode to the underlying collagen tissue.

11. The apparatus of claim 1, further comprising:

a cooling fluid source coupled to the cooling lumen.

12. The apparatus of claim 1, wherein the cooling fluid is water.

13. The apparatus of claim 1, wherein the membrane is a microporous membrane.

~~14. The apparatus of claim 1, wherein the membrane conforms closely to the surface of the skin.~~

15. The apparatus of claim 1, wherein the apparatus includes a plurality of RF electrodes.

16. The apparatus of claim 1, further comprising:

one or more thermal sensors positioned on the contacting exterior surface of the membrane.

17. The apparatus of claim 1, further comprising:

one or more impedance monitors positioned on the contacting exterior surface of the membrane.

18. The apparatus of claim 1, further comprising:

a feedback device responsive to a detected characteristic of the skin or subcutaneous layer that provides a controlled delivery of RF energy to the plurality of electrodes.

19. The apparatus of claim 18, wherein the detected characteristic is an impedance measurement of the skin

20. The apparatus of claim 18, wherein the detected characteristic is a temperature profile of the skin.

21. The apparatus of claim 18, wherein the feedback device includes a controller.

22. The apparatus of claim 18, wherein the feedback device includes a multiplexer.

23. A method of liposculpturing an area of the body including a skin with multiple layers, and an underlying area made of a loculation of fat that has collagen tissue as a fibrous septae, comprising:

providing a membrane and a thermal energy source;

creating a reverse thermal gradient which cools a top surface of the skin while heating the underlying loculation of fat;

heating the skin and underlying loculation of fat without substantially modifying melanocytes in the skin; and

contracting the collagen tissue of the fibrous septae by partially denaturing the collagen tissue with diminished destruction of cells.

24. The method of claim 23, wherein the collagen containing tissue is partially denatured by cleaving heat labile cross-links of collagen molecules.

25. The method of claim 23, wherein the collagen containing tissue is partially denatured while minimizing cellular destruction.

26. The method of claim 23, wherein the reverse thermal gradient produces a net mobilization of intracellular fat with diminished destruction of cells.

27. The method of claim 23, wherein the thermal energy source is an RF power source and one or more RF electrodes are positioned in the membrane.

28. The method of claim 27, further comprising:

a source of electrolytic solution that delivers electrolytic solution to the RF electrodes.

29. The method of claim 28, wherein RF energy is transferred from the RF electrodes to the electrolytic solution.

30. The method of claim 29, further comprising:

a cooling fluid lumen positioned in the membrane.

31. The method of claim 30, further comprising

a source of cooling medium that is introduced into the cooling fluid lumen.

32. The method of claim 23, wherein the collagen tissue is in a subdermal layer.

33. The method of claim 23, wherein the collagen tissue is in a deep dermal layer.

34. The method of claim 23, wherein the collagen tissue is in a subcutaneous layer.

35. The method of claim 23, wherein the collagen tissue is in fascial and muscle tissue.

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